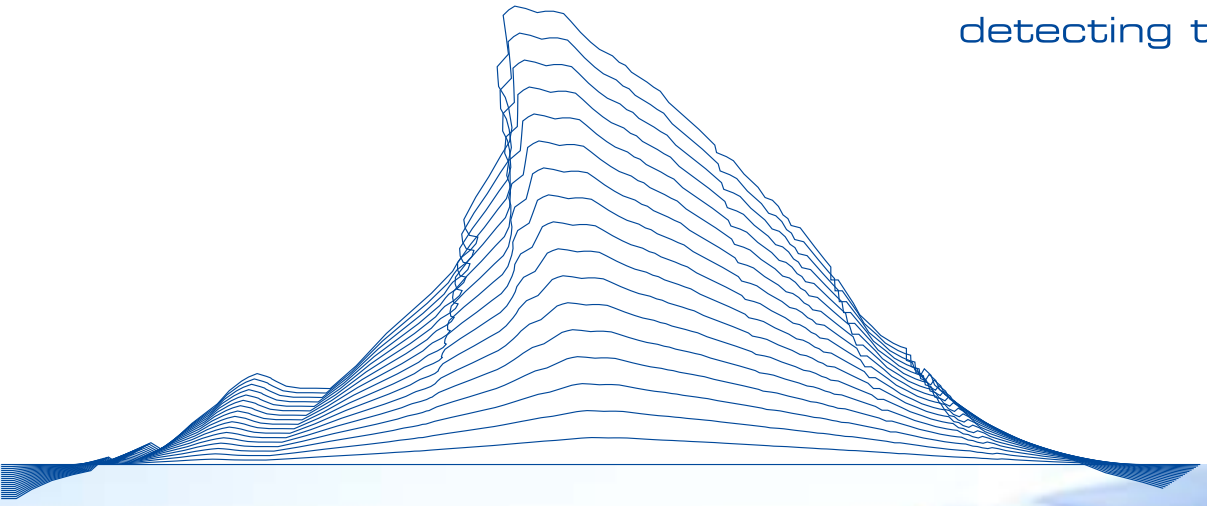
DECTRIS
detecting the future



DECTRIS SINGLA

A new hybrid pixel electron detector

Technical specifications

Frame rate	2,250 Hz at 16 bits 4,500 Hz at 8 bits
Count rate capability	> 1 pA/pixel
Number of pixels	1,024 x 1024
Sensor material	Silicon
Image bit-depth	32 bits
Energy range	30-200 keV
Point-spread function	< 1.3 pixel at 200 keV

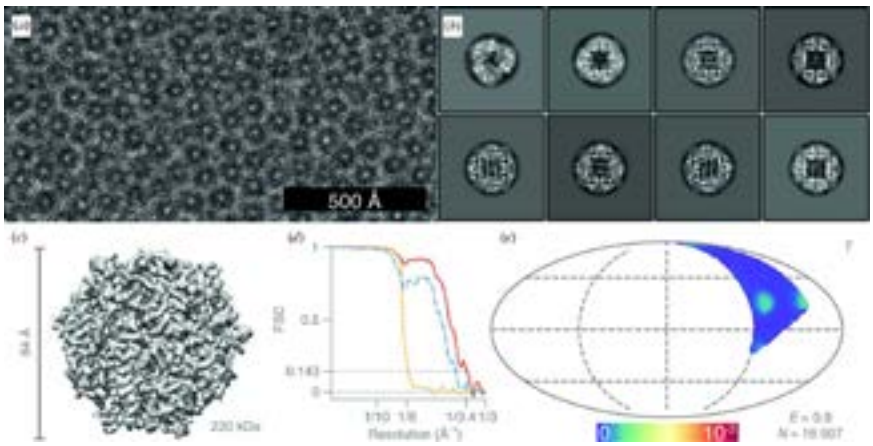
All specifications are subject to change without notice.

DECTRIS SINGLA for CryoEM and MicroED

The SINGLA 1M is an EIGER2-based electron detector. With its roughly 1,000 x 1,000 pixels, it is suitable for Cryo-Electron Microscopy (CryoEM) and Micro-Electron Diffraction (MicroED) applications. Single-particle analysis and cryo-electron tomography also benefit greatly from the detector's speed. In addition, the SINGLA's fast readout speed (exceeding 2,000 frames per second), combined with its superior dynamic range, make it the ideal detector for small-molecule and 3D micro-crystallography. The detector is bottom-mounted, with optional vacuum flanges for JEOL and Thermo Fisher Scientific transmission electron microscopes. It can be operated with SerialEM.

Naydenova, et al. „CryoEM at 100 keV: demonstration and prospects" IUCr Journal (2019) Vol. 6: 1086-1098. https://doi.org/10.1107/S2052252519012612

Typical CryoEM SPA (Single-Particle Acquisition) workflow. The sample is purified then vitrified in liquid ethane to preserve its near-native structure in a frozen but not crystallized buffer. The frozen-hydrated sample is then transferred to the cryoTEM and data is collected. A typical dataset is composed of hundreds of thousands molecular views of the biological particle under study. The data is then processed on powerful workstations to derive one or multiple 3D snaphots to build a reliable atomic model of the biological macromolecule. (Icons courtesy: Dr. Paolo Swuec, Human Technopole, Milan.)



Structure of DPS determined at 100 keV. (a) Typical micrograph of DPS after motion correction. Contrast is adjusted to ±3s from the mean intensity. (b) 2D class averages. (c) Sharpened masked 3D reconstruction of DPS from N = 16 507 particles with tetrahedral (T) symmetry. (d) Gold-standard FSC plot corresponding to the calculated map, showing the correlation between the phase-randomized (yellow), unmasked (blue) and masked (red) half-maps. The plot terminates at the Nyquist frequency. (e) Orientation distribution of the DPS particles contributing to the final reconstruction (Mollweide projection).

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